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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/589,411

11/15/2006

Yoshihiro Naruse

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IP GROUP OF DLA PIPER LLP (US)

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PHILADELPHIA, PA 19103

EXAMINER

MATZEK, MATTHEW D

ART UNIT

PAPER NUMBER

1786

NOTIFICATION DATE

DELIVERY MODE

04/01/2011

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

pto.phil@dlapiper.com

# Office Action Summary

**Application No.**

10/589,411

**Applicant(s)**

NARUSE ET AL.

**Examiner**

MATTHEW D. MATZEK

**Art Unit**

1786

**Period for Reply** -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 18 February 2011.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 132-134 and 136-150 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 132-134 and 136-150 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 August 2006 and 17 May 2010 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date: \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**Response to Amendment**

1. The amendment dated 2/18/2011 has been fully considered and entered into the Record. Claims 158 and 159 have been incorporated into claims 132 and 133. Claims 158 and 159 were also cancelled leaving claims 132-134 and 136-150 are active. All previous rejections are hereby withdrawn because none of the applied art addressed meltspun fibers of finite length.

**Claim Rejections - 35 USC § 112**

2. Claims 132-134 and 136-150 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claims 132 and 133 recite the limitation "wherein the adequate fiber length of short nanofibers in the nanofiber synthetic paper is 0.1 to 20mm." It is unclear if all of the nanofibers of the recited claims are "short" and it is also unclear as to what is meant by "adequate." Must all of the nanofibers within the claimed nanofiber synthetic paper be "adequate" or "short?" Examiner has interpreted the limitations to require meltspun fibers of finite length.

**Claim Rejections - 35 USC § 103**

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

3. Claims 132-134 and 136-150 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chhabra et al. (US 2005/0008776 A1).

a. Chhabra et al. disclose a melt spun nonwoven fabric comprising polymeric nanofibers [0014, 038]. The applied article does not have an “islands-in-the-sea” structure, but the product does read on the structure of the instantly claimed article in its final form. The diameters of the nanofibers are preferably between about 100 to 900 nanometers [0036]. The nanofibers have a finite length [0031]. The nanofiber fabric may have basis weights ranging from about 0.5-30 gsm [0039]. Pore diameter can be determined by methods known to those skilled in the art. The mean pore diameter is preferably less than about 15 microns, more preferably less than about 10 microns, and most preferably less than about 5 microns [0051]. The melt spun fabric is desirably homogenous and may be used as a filter [0041,42, and 0051]. The nonwoven fabric may be thicker than 10 microns [0049]. The article of Chhabra et al. may be joined with a layer of larger fibers having diameters of 3-5 microns [0038]. Claims 143 and 144 are rejected as the nonwoven fabric may be made with polypropylene which has a melting point of 165°C or higher [0013].

b. Chhabra et al. disclose preferable nanofiber diameters ranging from about 100-900 nanometers; therefore, the applied reference teaches values within and outside of the claimed range. The article of Chhabra et al. is directed to a filter paper. Smaller diameter

fibers within a filter lead to the formation of smaller pores within the paper when compared to filters made of larger fibers. Therefore it would be useful to have selected smaller diameter fibers within the teaching of Chhabra et al. motivated by the desire to form an article possessing smaller pores, which leads to the filtering out of a greater number of particulates compared to filters with larger pores. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have made the melt spun nanofiber fabric of Chhabra et al. with nanofibers having an average diameter of between 1 and 200 nanometers and 60% or more in the sum Pa of single fiber ratios, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or workable ranges involves only routine skill in the art. In re Aller, 105 USPQ 233.

c. The freeness of the nanofiber mat as well as the average pore area, permeability, and density are relative result-effective variables affecting permeability and effectiveness of the nanofiber mat. Decreasing freeness values as well as average pore area size increases the effectiveness of the filter by preventing the passage of ever smaller particles. An increase in density also leads to an increase in effectiveness of the filter in that there is less open space for particles to pass through. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the claimed freeness, density, permeability, and average pore size, it would have been obvious to one of ordinary skill in the art to optimize these result-effective variables by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

d. The applied reference fails to teach the number of holes with a diameter of 50 microns or more passing through from the front side to the reverse side of the synthetic paper, but it does teach that the mean pore diameter is preferably less than about 15 microns, more preferably less than about 10 microns, and most preferably less than about 5 microns [0051]. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to minimize the number of holes in excess of 50 microns to less than 1000 per square cm because the intent of the applied invention is minimize pore size within the article.

e. Claim 142 is rejected as the smoothness of the nanofiber layer of Chhabra et al. is a result-effective variable affecting the ability of the media being filtered to pass through the filter. Higher smoothness levels provide for less friction between fluid and filter causing a lower pressure drop through the filter, which extends the lifetime of the filter. Consequently, absent a clear and convincing showing of unexpected results demonstrating the criticality of the smoothness, it would have been obvious to one of ordinary skill in the art to optimize this result-effective variable by routine experimentation. In re Antonie, 559 F.2d 618, 195 USPQ 6 (CCPA 1977).

### **Response to Arguments**

4. Applicant's arguments with respect to claims 132-134 and 136-150 have been considered but are moot in view of the new ground(s) of rejection.

### **Conclusion**

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW D. MATZEK whose telephone number is (571)272-2423. The examiner can normally be reached on M-F, 9-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on 571.272.1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Matthew D Matzek/  
Examiner, Art Unit 1786

/D. Lawrence Tarazano/  
Supervisory Patent Examiner, Art Unit  
1786